

Client's ref.: TSMC2003-1006/PE:DCLin  
Our ref.: 0503-A30092-USf/Jonah/Steve/Nelson

**What Is Claimed Is:**

1        1. A system of automated sorter operation for held or  
2        banked wafer lots, comprising:  
3                a storage device capable of storing a plurality of process  
4                records, each process record corresponding to a wafer  
5                lot and comprising an identity and a current status  
6                indicating if the wafer lot is on hold, in a  
7                production or in a non-production bank; and  
8                a sorting module receiving a wafer lot identity, acquiring  
9                the current status corresponding to the wafer lot  
10               identity from the process record, issuing a first  
11                status setting instruction corresponding to the  
12                current status to a manufacturing execution system  
13                (MES) to release the wafer lot, issuing a flow  
14                instruction with sorting recipes directing the MES  
15                to perform a sorter operation, and issuing a second  
16                status setting instruction corresponding to the  
17                current status to the MES to hold or bank the wafer  
18                lot.

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1        2. The system of claim 1 wherein the sorting module  
2        stores the current status into a temporary file or table, issues  
3        the second status setting instruction corresponding to the  
4        current status in the temporary file or table, and removes the  
5        temporary file or table after the sorter operation.

1        3. The system of claim 1 wherein the wafer lot identity  
2        is input by an operator or a computer system.

1        4. The system of claim 1 wherein the MES releases or  
2        holds/banks the wafer lot based on the first status setting  
3        instruction or the second status setting instruction  
4        respectively.

1        5. The system of claim 1 further comprising a wafer  
2        sorter performing sorter operations according to sorting  
3        recipes.

1        6. The system of claim 5 further comprising a transport  
2        system transporting the wafer lot to the wafer sorter.

1        7. The system of claim 6 wherein the MES applies a tool  
2        dispatch rule to determine the wafer sorter starts the transport

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3 system and the wafer sorter to perform the sorter operation using  
4 automated instructions.

1 8. The system of claim 1 wherein the sorter operation is  
2 slot mapping, carrier exchange, wafer lot combination or splits.

1 9. A method of automated sorter operation for held or  
2 banked wafer lots, the method comprising using a computer to  
3 perform the steps of:

4 receiving a wafer lot identity;  
5 acquiring the current status corresponding to the wafer lot  
6 identity from a process record, wherein the process  
7 record corresponding to a wafer lot comprises the  
8 identity and the current status indicating if the  
9 wafer lot is on hold, in a production or in a  
10 non-production bank;

11 issuing a first status setting instruction corresponding  
12 to the current status to a manufacturing execution  
13 system (MES) to release the wafer lot;

14 issuing a flow instruction with sorting recipes to direct  
15 the MES to perform a sorter operation; and

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16 issuing a second status setting instruction corresponding  
17 to the current status to the MES to hold or bank the  
18 wafer lot.

1 10. The method as claimed in Claim 9 further comprising  
2 the steps of:

3 storing the current status into a temporary file or table;  
4 issuing the second status setting instruction  
5 corresponding to the current status in the temporary  
6 file or table; and  
7 removing the temporary file or table.

1 11. The method as claimed in Claim 9 wherein the wafer lot  
2 identity is input by an operator or a computer system.

1 12. The method of claim 9 further comprising the steps of:  
2 releasing the wafer lot based on the first status setting  
3 instruction by the MES; and  
4 holding or banking the wafer lot based on the second status  
5 setting instruction by the MES.

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1           13. The method of claim 9 further comprising a step of  
2        performing the sorter operation according to sorting recipes by  
3        the wafer sorter.

1           14. The method of claim 13 further comprising a step of  
2        transporting the wafer lot to the wafer sorter by the transport  
3        system.

1           15. The method of claim 14 further comprising the steps  
2        of:

3        applying a tool dispatch rule to determine the wafer sorter  
4        by the MES for the given wafer lot;  
5        starting the transport system to transport the wafer lot  
6        to the wafer sorter by the MES using automated  
7        instructions; and  
8        starting the wafer sorter to perform the sorter operation  
9        by the MES using automated instructions.

1           16. The method of claim 9 wherein the sorter operation is  
2        slot mapping, carrier exchange, wafer lot combination or splits.

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3           17. A storage medium for storing a computer program which  
4       when executed performs a method of automated sorter operation  
5       for held or banked wafer lots, the method comprising the steps  
6       of:  
7           receiving a wafer lot identity;  
8           acquiring the current status corresponding to the wafer lot  
9           identity from a process record, wherein the process  
10          record corresponding to a wafer lot comprises the  
11          identity and the current status indicating if the  
12          wafer lot is on hold, in a production or in a  
13          non-production bank;  
14          issuing a first status setting instruction corresponding  
15          to the current status to a manufacturing execution  
16          system (MES) to release the wafer lot;  
17          issuing a flow instruction with sorting recipes to direct  
18          the MES to perform a sorter operation; and  
19          issuing a second status setting instruction corresponding  
20          to the current status to the MES to hold or bank the  
21          wafer lot.

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1        18. The storage medium of claim 17, wherein the method  
2        further comprises the steps of:  
3                storing the current status into a temporary file or table;  
4                issuing the second status setting instruction  
5                corresponding to the current status in the temporary  
6                file or table; and  
7                removing the temporary file or table.

1           19. The storage medium of claim 17 wherein the wafer lot  
2           identity is input by an operator or a computer system.

1           20. The storage medium of claim 17 further comprising the  
2 steps of:  
3           releasing the wafer lot based on the first status setting  
4           instruction by the MES; and  
5           holding or banking the wafer lot based on the second status  
6           setting instruction by the MES.

1           21. The storage medium of claim 17, wherein the method  
2        further comprises a step of performing the sorter operation  
3        according to sorting recipes by the wafer sorter.

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1           22. The storage medium of claim 21, wherein the method  
2        further comprises a step of transporting the wafer lot to the  
3        wafer sorter by the transport system.

1           23. The storage medium of claim 22, wherein the method  
2           further comprises the steps of:

3 applying a tool dispatch rule to determine the wafer sorter

4 for the given wafer lot by the MES;

5 starting the transport system to transport the wafer lot

to the wafer sorter by the MES using automated

instructions; and

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8 starting the water sorter to perform the sort of oper.

9 by the MES using automated instructions.

1 24. The storage medium of claim 17 wherein the sorter

2 operation is slot mapping, carrier exchange, wafer lot

3 combination or splits.